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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,246	10/28/2003	Joerg Bischoff	509982005700	7040
20872	7590	12/06/2005	EXAMINER	
MORRISON & FOERSTER LLP 425 MARKET STREET SAN FRANCISCO, CA 94105-2482			NGUYEN, SANG H	
			ART UNIT	PAPER NUMBER
			2877	

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

10/696,246

Applicant(s)

BISCHOFF ET AL.

Examiner

Sang Nguyen

Art Unit

2877

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 10, 13, 14, 22 and 25 is/are rejected.
- 7) ☒ Claim(s) 3-9, 11, 12, 15-21, 23 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Application contains claims 1-25 by the amendment on 07/01/05.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

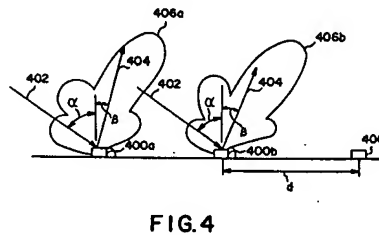
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Taubenblatt (U.S. Patent No. 5,432,607).

Regarding claim 1; Taubenblatt discloses method for examining a structure (400 of figure 4 and col.6 lines 10-23) formed on a semiconductor wafer (col.3 lines 13-22), comprising:

- directing an incidence beam (332 of figure 5) to the structure (400a, 400b, 400c of figure 4) of the surface sample (340 of figure 5) at an incidence angle (**THETA 1** of figure 5) and an azimuth angle (**PHI 1** of figure 5 and col.9 line 65 to col.10 line 2 and lines 40-54 and claim 7) by a laser source (310 of figure 5),
- scanning the incidence beam (332 of figure 5) over a range of a range of azimuth angles (**PHI 1, PHI 2** of figure 5) to obtain an azimuthal scan of the structure considered to be a scanning state (390 of figure 5) with azimuth angle (**PHI 1** of figure 5); and

- U.S. Patent July 11, 1995 Sheet 4 of 5 5,432,607 U.S. Patent July 11, 1995 Sheet 3 of 5 5,432,607



- a laser source (310 of figure 5) for directing an incidence beam (332 of figure 5) to the structure (400a, 400b, 400c of figure 4) of the surface sample (340 of figure 5) at an incidence angle (**THETA 1** of figure 5) and an azimuth angle (**PHI 1** of figure 5 and

col.9 line 65 to col.10 line 2 and lines 40-54 and claim 7), wherein the incident beam (332 of figure 5) is scanned over a range of azimuth angles (**PHI 1, PHI 2** of figure 5) by an azimuthal scan considered to be a scanning stage (390 of figure 5 and col. 10 lines 7-10); and

- a CCD camera (370 of figure 5) for detecting the cross polarization components (350 of figure 5 as defined analyzing polarizer [350] has S polarized component and P polarized component [see figure 2]) of diffracted beams (342 of figure 6A) from the structure of surface sample (340 of figure 5) during the azimuthal scan by the scanning stage (390 of figure 5). See figures 1-6.

It is noted that in regarding claim 13, the recitation “examining a three dimensional structure” has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taubenblatt (U.S. Patent No. 5,432,607) in view of Hayashi (U.S. Patent No. 4,837,603).

Regarding claims 2 and 14; Taubenblatt discloses all of features of claimed invention as indicate the incident beam (112 of figure 1) passing through a polarization adjusting mean (120 of figure 1) for producing a polarized light beam (122 of figure 1), wherein the polarized of incidence beam (122 of figure 1) a has both two components as a S polarized component has polarization perpendicular to the plane incidence and P polarized component has a polarization parallel to the plane of incidence (col.5 lines 40-45) except for the incident beam is polarized at a polarization angle of zero or 90 degrees. However, Hayashi teaches that it is known in the art to provide a correction azimuth angle of the photometric ellipsometers comprising the incident beam is polarized at a polarization angle of zero or 90 degrees by a polarizer (2 of figure 1) and

analyzer (4 of figure 1 and col.2 lines 45-46). It would have been obvious to one having ordinary skill in the art at the time the invention was made modify a system and method for examining a three dimensional structure formed on the semiconductor wafer of Taubenblatt with the incident beam is polarized at a polarization angle of zero or 90 degrees as taught by Hayashi for the purpose of correcting the azimuth angle of a photometric ellipsometer capable of reducing the error of the azimuth angle by a simple way (col.1 lines 50-55).

Claims 10, 22, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taubenblatt (U.S. Patent No. 5,432,607) in view of Michaelis (U.S. Patent No. 5,979,244).

Regarding claims 10, 22, and 25; Taubenblatt discloses all of features of claimed invention as **indicated in claims 1 and 13**, except for determining one or more of conditions including: a) a zeroth azimuth position, wherein the cross polarization components are zero at the zero azimuth position; b) symmetry of a contact hole in a contact hole array; and c) the rotation of the structure is determined based on the azimuthal scan. However, at figures 4-6 and 8 of Michaelis teaches that it is known in the art to provide a controlling unit (618 of figure 6) coupled to a rotating stage (602 of figure 6) for determining one of conditions for rotating of the angle structure sample (620 of figure 6 and col.4 lines 10-16 and 36-42, and col.10 lines 1-13 and 44-49). It would have been obvious to one having ordinary skill in the art at the time the invention was made modify a system and method for examining a structure formed on the semiconductor wafer of Taubenblatt with determining one or more of conditions

including the rotation of the structure is determined based on the azimuthal scan as taught by Michaelis for the purpose of evaluating internal stress on a sample at high lateral resolution (col.2 lines 5-10).

Allowable Subject Matter

Claims 3-9, 11-12, 15-21, and 23-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The prior art of record, taken alone or in combination, fails discloses or render obvious a method and system for examining a three dimensional structure formed on a semiconductor comprising all the specific elements with the specific combination including of a zero azimuth position is determined based on the azimuthal scan, wherein the cross polarization components are zero at the zero azimuth position in set forth limitation of claims 3 and 15.

The prior art of record, taken alone or in combination, fails discloses or render obvious a method and system for examining a three dimensional structure formed on a semiconductor comprising all the specific elements with the specific combination including of detecting azimuthal misalignment of the measured diffraction signal to a simulated diffraction signal based on the determined zero azimuth position in set forth limitation of claims 5 and 17.

The prior art of record, taken alone or in combination, fails discloses or render obvious a method and system for examining a three dimensional structure formed on a semiconductor comprising all the specific elements with the specific combination

including of the three dimensional structure is a contact hole array, wherein a contact hole array is determined to be asymmetric based on the azimuthal scan in set forth limitation of claims 7 and 19.

The prior art of record, taken alone or in combination, fails discloses or render obvious a method and system for examining a three dimensional structure formed on a semiconductor comprising all the specific elements with the specific combination including of the rotation of the structure is determined when the cross polarization reach a minimum but are not zero and the cross polarization terms are not symmetric about the minimum in set forth limitation of claims 11 and 23.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fairley et al (6816249) discloses high throughput brightfield/darkfield wafer inspection system; Freeouf (6323947) discloses angle of incidence accuracy in ultrathin dielectric layer ellipsometry measurement; or Gold et al (5042951) discloses high resolution ellipsometric apparatus.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sang Nguyen whose telephone number is (571) 272-2425. The examiner can normally be reached on 9:30 am to 7:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J. Toatley, Jr. can be reached on (571) 272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2877

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

December 01, 2005


Patent Examiner
Sang Nguyen
Art Unit 2877